

# Theory of the Firm

Profit

- How does a producer know when to stay in business and when to give up?
- How does a producer know the best quantity of output to produce?

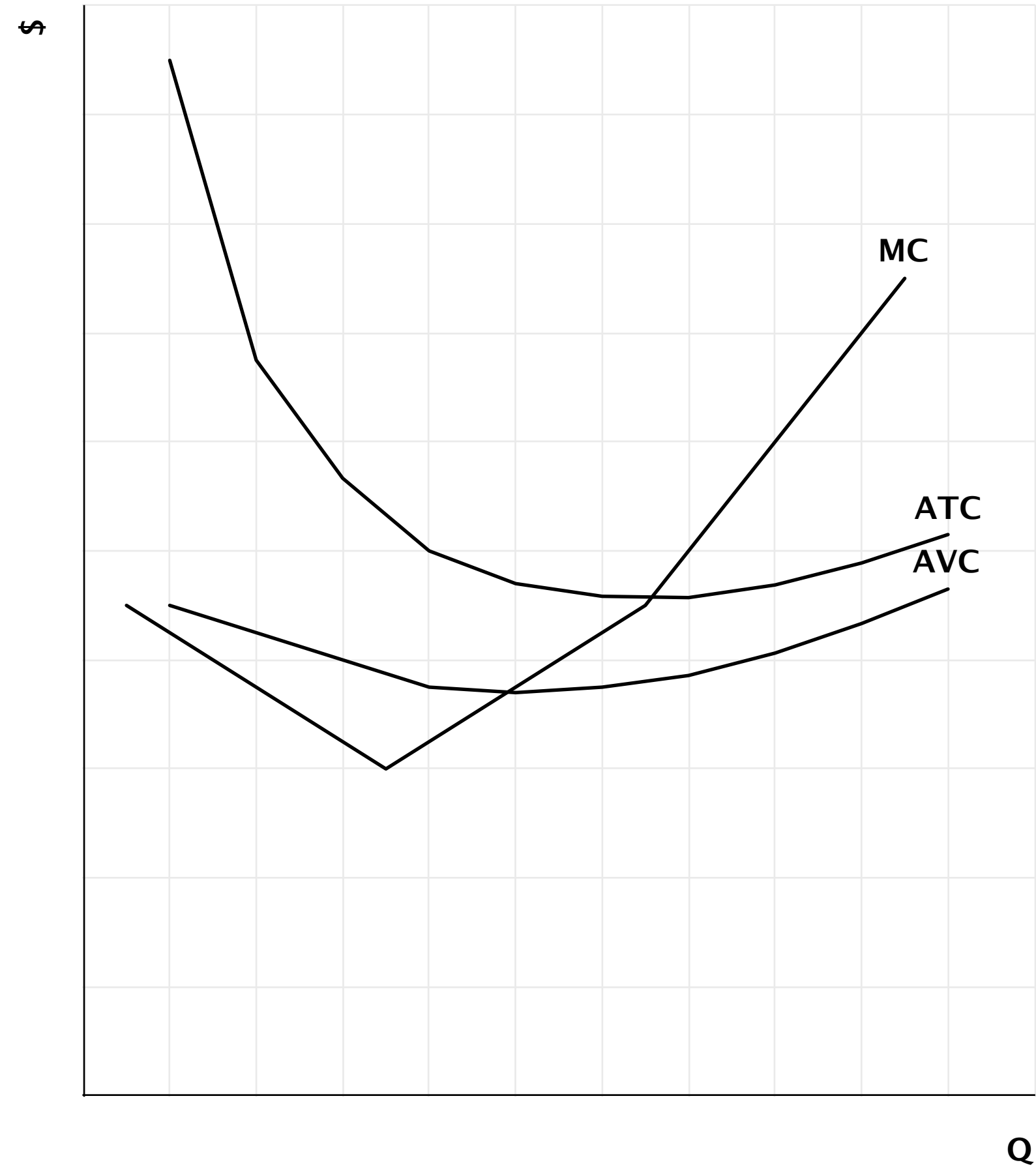
# Three key situations:

- the shut down price
- the break-even price
- the profit-maximizing level of output

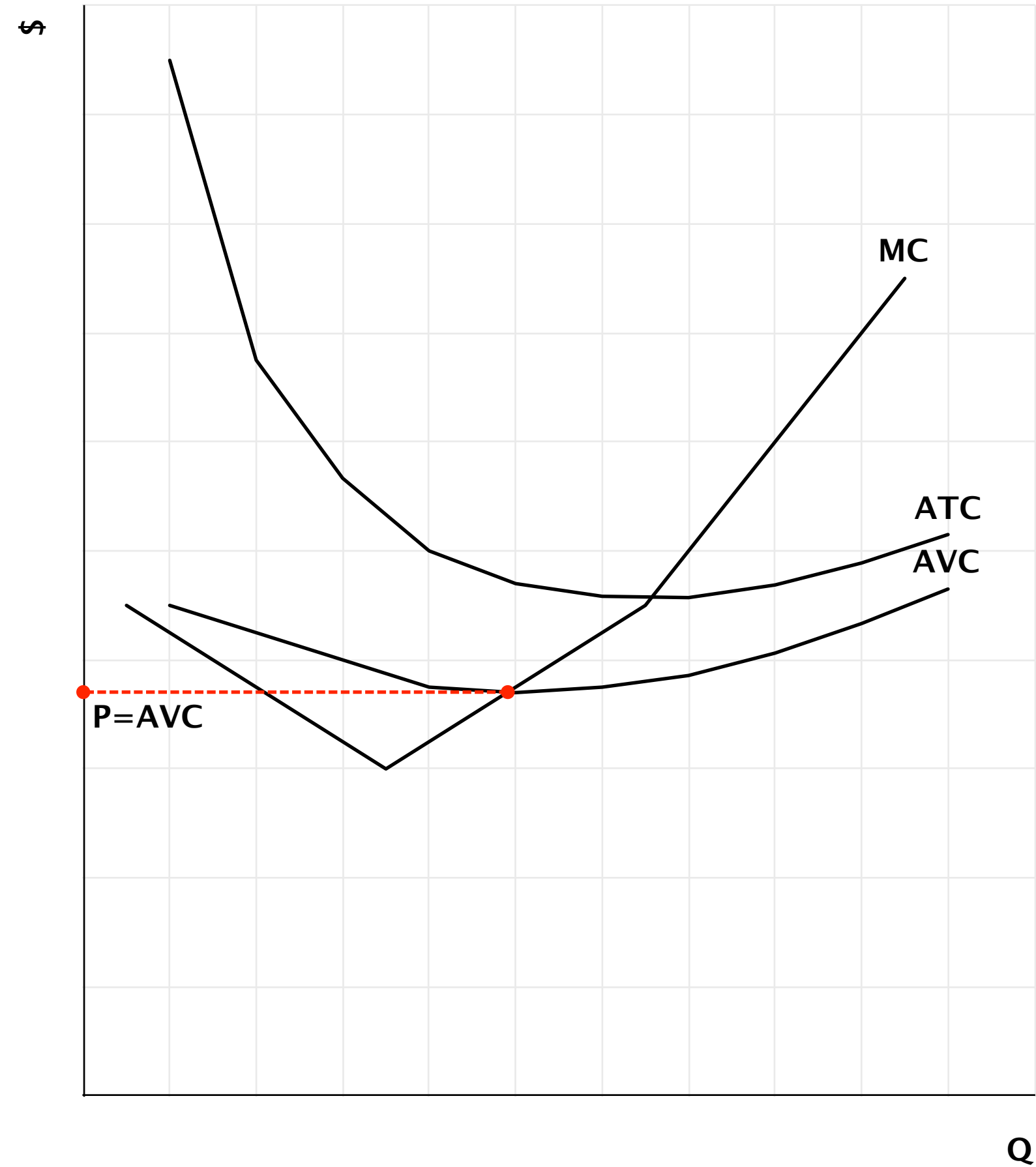
# Shut-down price

- Occurs when  $P = AVC$
- At any price below this, it is better for the firm to shut down and produce 0 output.
- The firm will lose its fixed costs, but will not lose any variable costs (which is 0 because there is no output).

- Here are the cost curves:



- Here is the shut-down price:



# Example

- There are three firms, all producing zombie repellent, and all making losses.
- Who would be better off by shutting down and who should continue to produce?

|      | Billy   | Kate    | Izzy    |
|------|---------|---------|---------|
| TR   | 80,000  | 120,000 | 150,000 |
| TFC  | 100,000 | 100,000 | 100,000 |
| TVC  | 100,000 | 120,000 | 140,000 |
| TC   | 200,000 | 220,000 | 240,000 |
| Loss | 120,000 | 100,000 | 90,000  |



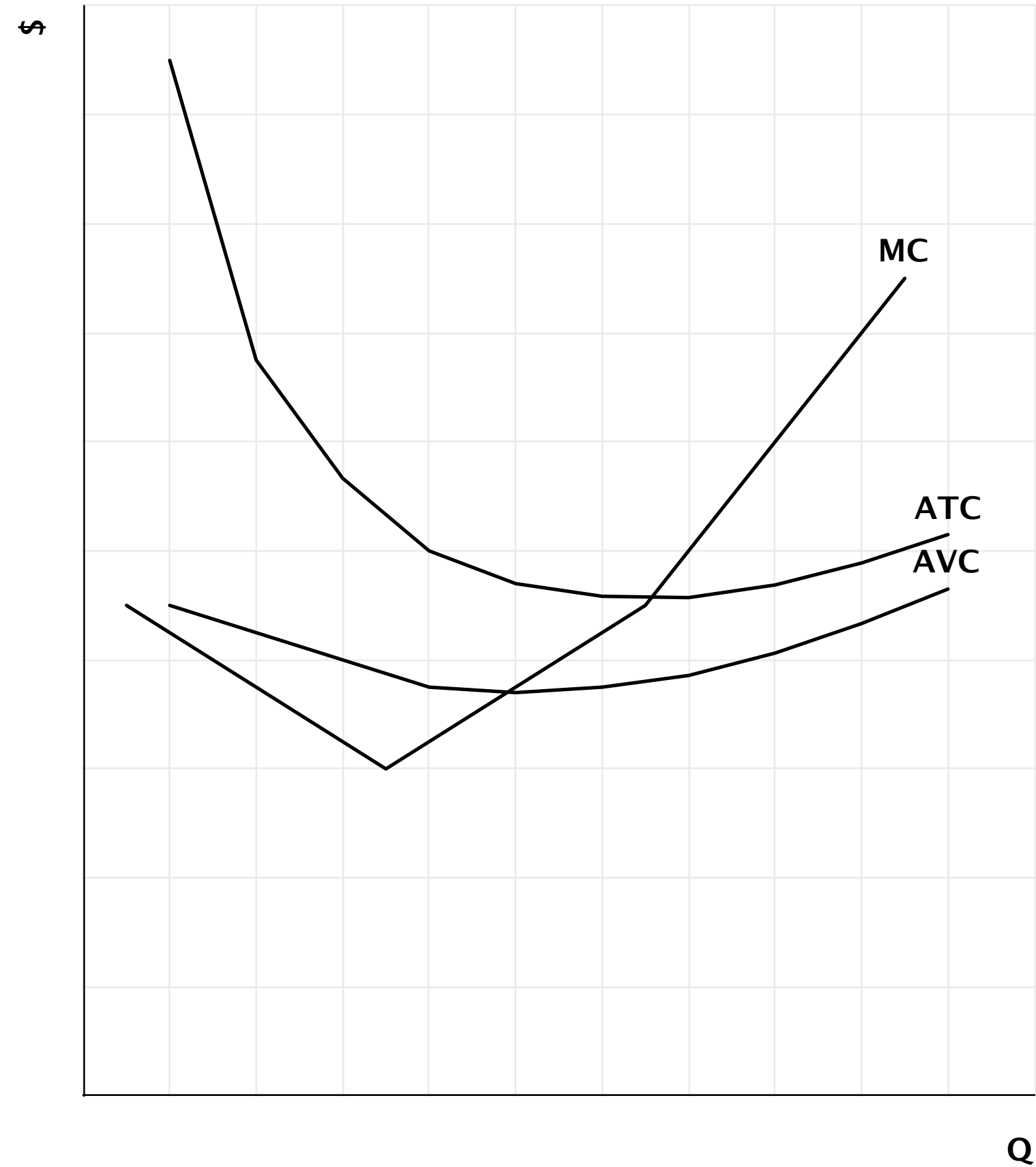
- Billy should shut down. Billy is covering **some** of his variable costs. By producing, he is losing 120,000, but if he shuts down he will only lose 100,000 – his fixed cost.
- Kate is covering **all** of her variable costs (exactly). She will lose 100,000 (the fixed cost) if she shuts down or continues to produce. She should stay open to keep her customers.
- Izzy is covering **all** of his variable and **some** of his fixed costs, but is still losing 90,000. If he shuts down, he will lose all of his fixed cost – 100,000. He should continue to produce.

- All of these firms cannot continue to lose money in the long run. They need to change their factors of production in order to cover all of their costs. If not, they will be out of business permanently!

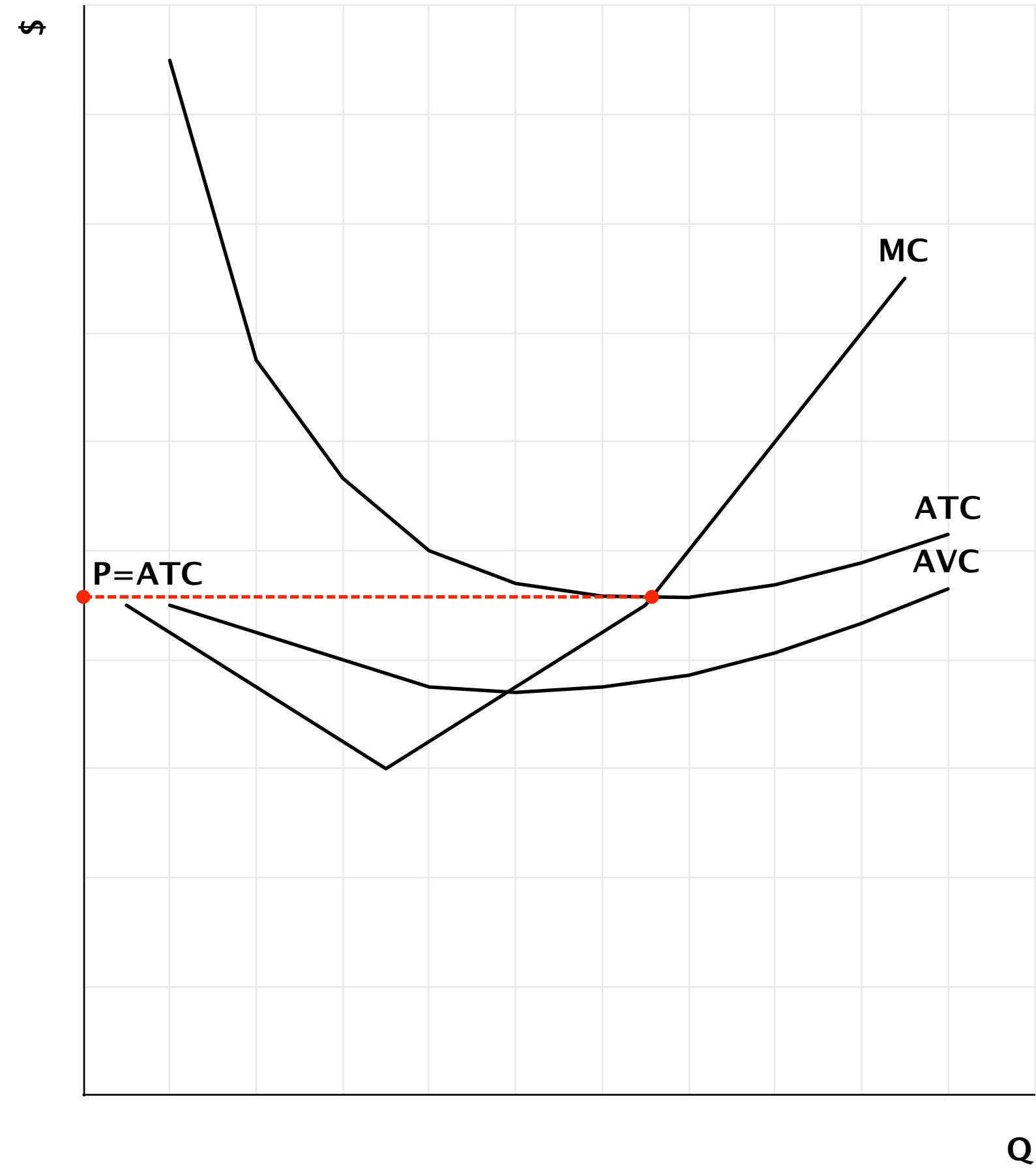
# Break-even price

- Occurs when  $P = ATC$
- At this price, the firm is covering ***all*** of its costs (including opportunity costs).
- It is making normal economic profit.
- This is a good thing!

- Here are the cost curves:



- Here is the break-even price:



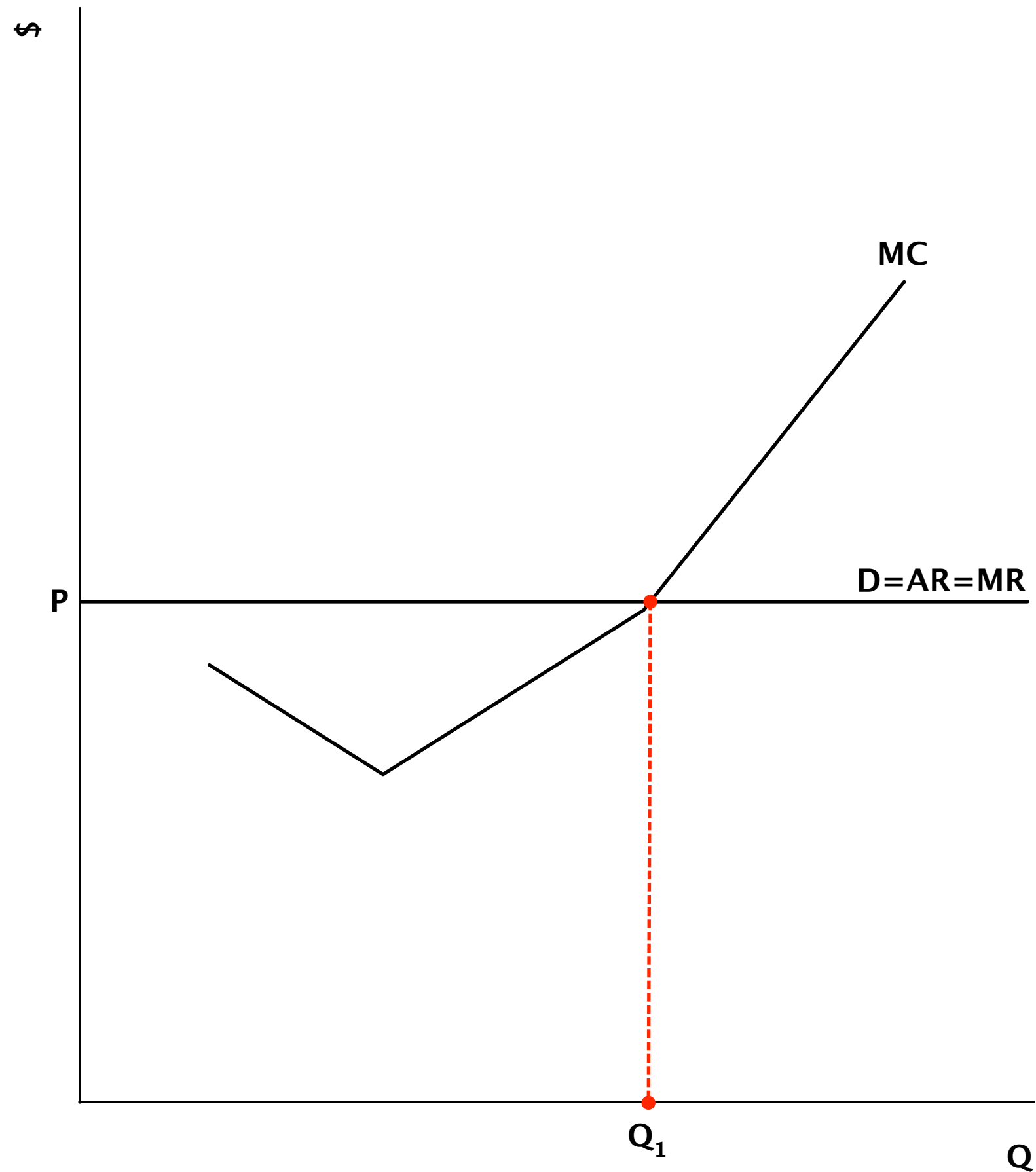
Profit-maximization

$$MR = MC$$

# Profit-maximization

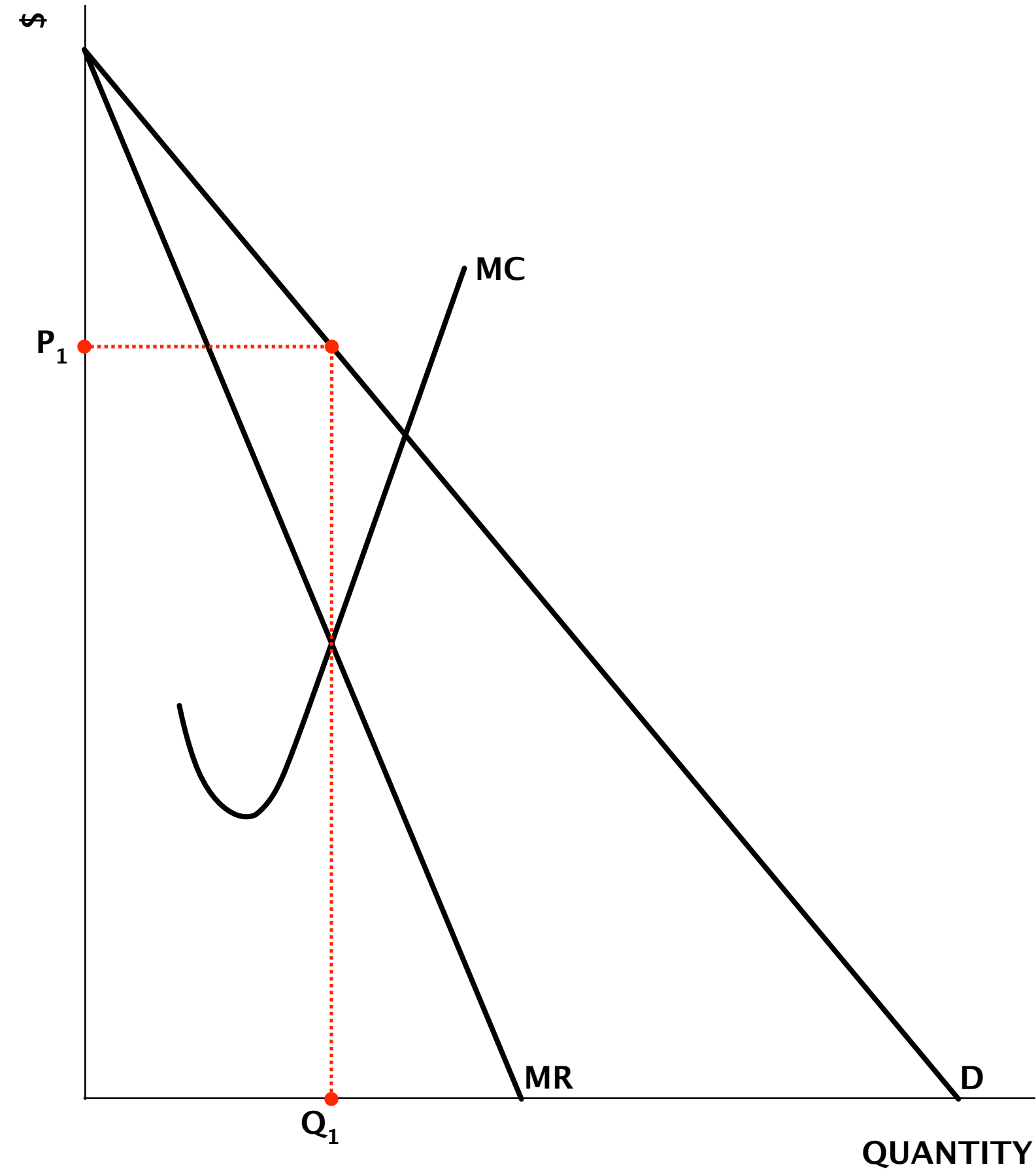
- Firms will ***always*** produce at the profit-maximizing level of output!

- Here is marginal cost and marginal revenue for perfectly elastic demand:





- Here is marginal cost and marginal revenue for a downward sloping demand:



- If  $MR > MC$ , produce more.
- If  $MR < MC$ , you've gone too far.
- If  $MR = MC$ , you're doing the best can.